Jay's Crohn's Disease Biomarker Improvement Through Diet

DATE	Reference value	2022-11-28	2023-01-26	2023-03-02	2023-06-20	2023-08-09	2023-08-10	2023-08-30	2023-10-26	2023-11-22	2024-01-13	2024-03-07	2025-02-27
Height		157.1cm	158.7cm	158.5cm	158.5cm	159.4cm	159.4cm	159.9cm		161.7cm		164.3cm	175cm
Weight		50.75kg	44.70kg	45.35kg	45.75kg	43.6kg	43.6kg	42.7kg		47.6kg		53.85kg	58.5kg
Calpro(ug/g)	<100ug/g; Normal 100-160 ug/g; Borderline >160ug/g; Elevated	146.0	288.0		222.0		989.0			385.0	**< 100**		
Calciuum	**8.8-10.5 mg/dL**	9.5	10.0	9.4	9.7	8.2	9.2	9.2	9.3	9.0	9.6	9.3	
Phosphorus	**3.3-5.7 mg/dL**	4.7	5.0	4.6	4.6	5.3	4.5	4.5	4.6	4.0	5.4	5.6	
Glucose	**70-110 mg/dL**	91.0	95.0	95.0	89.0	90.0	89.0	89.0	98.0	103.0	94.0	92.0	
Uric acid	**3.0-7.0 mg/dL**	3.7	3.6	3.0	2.7	2.9	3.4	3.4	3.6	3.1	3.9	4.3	
T.protein	**6.0-8.0 g/dL**	7.2	7.6	6.9	7.2	7.4	7.3	7.3	7.0	7.0	7.3	6.9	
Albumin	**3.3-5.2 g/dL**	4.4	4.6	4.1	4.2	4.2	4.1	4.1	4.1	4.1	4.3	4.1	
Alk.phos	**152-438 IU/L**	320.0	279.0	207.0	266.0	275.0	279.0	279.0	278.0	299.0	334.0	376.0	
AST(GOT)	**1-40 IU/L**	17.0	19.0	17.0	19.0	17.0	17.0	17.0	17.0	16.0	18.0	18.0	
ALT(GPT)	**1-40 IU/L**	8.0	10.0	9.0	12.0	8.0	9.0	9.0	8.0	8.0	9.0	8.0	
BUN	**10-26 mg/dL**	6.0	8.0	8.0	10.0	13.0	9.0	9.0	9.0	13.0	7.0	7.0	
Creatinine	**0.6-1.4 mg/dL**	0.66	0.56	0.53	0.57	0.57	0.55	0.55	0.6	0.60	0.57	0.57	
eGFR(Schwartz Cr)	**mL/min/1.73m2**	98.06	114.90	121.41	113.68	115.50	120.07	120.07	113.9	109.93	117.16	118.25	
Na	**135-145 mmol/L**					136.0	139.0	139.0	140.0	142.0	138.0	139.0	
K	**3.5-5.5 mmol/L**					4.1	4.3	4.3	4.4	4.5	4.6	4.6	
Cl	**98-110 mmol/L**					102.0	105.0	105.0	107.0	108.0	104.0	108.0	
hs-CRP	**0-0.5 mg/dL**	**0.28**	**0.32**	**0.39**	**0.54**	**0.53**	**0.78**	**0.78**	**0.65**	**0.36**	**0.22**	**0.24**	
WBC	**4.5-13.0 x 10^3/μL**	5.44		5.77	6.34	7.05	6.53	7.21	6.63	8.23	7.23	4.87	
RBC	**4.5-5.3 10^6/μL**	5.05		5.34	4.63	4.55	4.74	4.92	4.77	4.89	5.01	4.71	
Hb	**13.0-16.0 g/dL**	12.4		13.2	11.8	11.8	12.1	12.5	12.1	12.6	12.8	12.2	
Hct	**37-49 %**	39.2		41.6	36.5	36.5	37.9	39.7	37.9	40.2	40.5	38.1	
MCV	**78-98 fL**	77.6		77.9	78.8	80.2	80.0	80.7	79.50	82.2	80.8	80.9	
MCH	**25-35 pg**	24.6		24.7	25.5	25.9	25.5	25.4	25.40	25.8	25.5	25.9	
MCHC	**31-37 g/dL**	31.6		31.7	32.4	32.3	31.9	31.5	31.90	31.3	31.6	32.0	
RDW	**11.5-14.5 %**	14.7		14.8	14.6	13.6	13.8	13.3	13.80	14.4	13.8	13.7	
Platelet	**130-400 x 10^3/μL**	388.0		393.0	359.0	396.0	401.0	393.0	383.0	403.0	414.0	328.0	
PCT	**0.15 -0.32 %**	0.33		0.33	0.29	0.33	0.34	0.31	0.31	0.32	0.32	0.26	
MPV	**8.9-12.0 fL**	8.4		8.3	8.1	8.3	8.4	7.9	8.0	8.0	7.7	7.8	
PDW	**9.9-16 fL**	8.0		8.0	7.5	7.6	8.0	7.7	7.1	7.5	7.4	7.1	
ESR	**0-9 mm/hr**	**11.0**		**22.0**	**17.0**	**21.0**	**24.0**	**32.0**	**6.0**	**23.0**	**15.0**	**7.0**	
Seg.neut	**50-75 %**	58.9		57.5	64.1	65.7	60.9	64.5	61.7	66.0	63.7	57.5	
Lymphocyte	**20-44 %**	33.3		33.6	27.8	26.1	30.0	26.9	28.8	25.0	28.8	34.1	
monocyte	**2-9 %**	6.1		6.8	6.5	6.5	6.1	4.9	6.9	6.7	5.4	6.4	
Eosinophil	**1-5 %**	1.3		1.6	1.1	1.3	2.5	3.1	1.8	1.8	1.5	1.6	
Basophil	**0-2 %**	0.4		0.5	0.4	0.4	0.5	0.6	0.8	0.5	0.6	0.4	
Nomoblast	**0-0/100WBC**	-		-	-	-	-	-		-	-	-	
ANC	**1800-7000 /μL**	3,204		3,318	4,060	4,632	3,977	4,650	4,091	5,432	4,606	2,800	
BEC	**0-500 /μL**	71		92	70	92	163	224	119	148	108	78	

Jay’s Crohn’s Disease Biomarker Improvement Through Diet

The Role of Fecal Calprotectin in Monitoring Crohn’s Disease

Fecal calprotectin (FC), a calcium- and zinc-binding protein released by neutrophils in response to inflammation, has emerged as a **key biomarker in inflammatory bowel disease (IBD)** due to its high sensitivity and specificity in detecting mucosal inflammation. Elevated fecal calprotectin levels correlate strongly with endoscopic findings of active inflammation, making it a valuable tool for both **diagnosis and disease monitoring** (**Raisch et al., 2019**). Unlike CRP and ESR, which reflect systemic inflammation, FC is **directly indicative of intestinal inflammation**, providing a more precise measure of disease activity in the gastrointestinal tract (**Holtman et al., 2016**).

A persistently elevated FC level is associated with **higher risks of disease relapse and progression**, whereas sustained reductions in FC, as observed in Jay’s case, suggest **effective mucosal healing and long-term disease control** (**Mooiweer et al., 2015**). Jay’s **gradual yet consistent decline in FC levels over time** further supports the growing body of evidence indicating that **dietary interventions can play a significant role in reducing intestinal inflammation** by modulating the gut microbiome and immune response (**Lewis et al., 2022**).

Dietary Impact on Crohn’s Disease and Biomarker Regulation

Jay’s ability to achieve biochemical remission through dietary intervention alone aligns with **emerging clinical data** highlighting the potential of **nutritional strategies as both primary and adjunctive therapies for pediatric Crohn’s disease**. Studies have demonstrated that exclusion diets, such as the **Specific Carbohydrate Diet (SCD)** and the **Crohn’s Disease Exclusion Diet (CDED)**, can **alter the microbial ecosystem**, reducing pro-inflammatory bacterial populations and enhancing the abundance of beneficial bacteria, thereby contributing to decreased disease activity and improved long-term outcomes (**Levine et al., 2019**).

Additionally, research on the **gut-liver-immune axis** has suggested that **dietary components can directly influence intestinal barrier integrity, microbial diversity, and the production of short-chain fatty acids (SCFAs)**, which exert **anti-inflammatory effects** and contribute to gut homeostasis (**Lavelle & Sokol, 2020**). Jay's case provides a compelling **real-world example** of how targeted **nutritional interventions can drive clinical improvement**, reinforcing the importance of dietary modulation in IBD management.

Recognizing the profound impact of this approach, it has become an imperative to share these findings with other children and families navigating similar challenges, fostering broader awareness of **diet as a viable therapeutic tool in Crohn's disease**. By disseminating this information, we aim to provide **evidence-based guidance and inspiration** to those seeking alternative or complementary approaches to disease management, ultimately contributing to the growing movement toward **patient-centered, nutrition-focused care in IBD**.

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